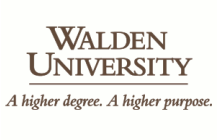

2019

Strategies for Patient Engagement in a Self-Management Program for Adults with Diabetes

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This is to certify that the doctoral study by

Caroline Ogungbayi

has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

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2019

Abstract

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by

Caroline Jokotola Ogungbayi

MS, Walden University, 2014

BS, Texas Woman's University, 2007

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Patients' lack of adherence to diabetes self-management education and support (DSMES) recommendations is a challenge for healthcare. One approach to addressing patient noncompliance with DSMES is through education of staff on current guidelines. In an outpatient facility in South Texas, staff training on current DSMES guidelines was recommended as one of the solutions to the problem of Type 2 diabetes mellitus (T2DM) complications observed among clinic patients. An educational module was created to increase staff knowledge on T2DM and to assist staff members in teaching patients to self-manage T2DM. The module was built on the self-management and health promotion models, as well as self-regulation, dual process, and social learning theories. The DSMES educational module created for clinic staff consisted of a lecture presentation on current diabetes information and management guidelines, and a pre- and posttest survey based on 13 close-ended questions. The generated data were summarized and analyzed using McNemar's test for paired, binary data. Results revealed that the module was useful for clinic staff in updating their T2DM and DSMES knowledge. Improvement in staff expertise might lead to positive social changes related to improved patient self-care of diabetes and reduction in financial burden in the longer term.

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Dedication

I dedicate my life and my academic achievements to Almighty God. I thank God for his mercies and blessings in my life, and for giving me the ability to persevere through all my challenges.

I am also dedicating this achievement to my late father Jacob Bolarinwa, though not educated, believed in education. His desire to see me climb up the ladder to the highest peak of my career gave me the inner strength to continue to this level. To my very intelligent, strong and dedicated mother, Mrs. Mojisola Bolarinwa, thank you for believing in me; I love you.

To my incredible, adorable, and amazing children, whose humbleness, love and support, inspire me to write this dedication. Words are not enough to describe my gratitude, and joy for having both of you in my life, Aderonke Nichele Ogungbayi and Adetunji Richie Ogungbayi. I love very much, and thank you.

To my dearest brothers Lawrence Bankole Bolarinwa (late), Isaac Kayode Bolarinwa, Ezekiel Olatunbosun Bolarinwa, and my sister-in-law Bola Adu Kayode. Thank you for your unconditional love and support. To my best friend and personal person, Prince Adesanya Aderinwale, thank you for your support and encouragement, and for not allowing me to give up. God Almighty will pave your way.

Acknowledgments

I want to seize this opportunity to express my sincere gratitude to my project chair, Dr. Rosaline Olade. Thank you for your time, and dedication towards my completion of this project. I am also acknowledging Dr. Sandra Wise (committee member) and Dr. Tracy Wright (URR) for their time, promptness and constructive review of this project. Thank you. Lastly, I am thanking the doctoral project director, Dr. Moss for your contribution and support.

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Section 1: Nature of the Project

Introduction

Type 2 diabetes mellitus (T2DM) is a chronic condition where there is an abnormal state of sugar (glucose) in the blood (Wisse, 2014). It is an increasing national health problem affecting about 10% of the U.S. population (American Diabetes Association, 2015). It is a chronic disease that requires ongoing medical care and may cause complications; therefore, it is important for the disease to be controlled and/or prevented to avert unnecessary cost (Powers et al., 2015). Research has shown that diabetes can be successfully managed and it hinges on self-protection (American Diabetes Association, 2016a). Specifically, this includes self-monitoring of blood pressure and glucose, changes in healthy lifestyles, and adherence to medication. In 2016, the American Diabetes Association (ADA) formulated steps based on the Diabetes Self-Management Education and Support (DSMES) program (ADA, 2016a; ADA, 2016b; ADA, 2017A; ADA, 2017B). The ADA has recommended that DSMES is particularly important for people with uncontrolled diabetes or diabetic complications to prevent worsening of the disease or mortality due to complications. The DSMES should have a patient-centered approach that takes into account an individual's preferences, customs, and practices (Inzucchi et al., 2012). Furthermore, it requires constant patient training and support through frequent contact with diabetes care managers and staff, such as specialized nurses who are practicing with doctors and other caregivers (ADA, 2015).

The efficacy of diabetic preventative and management measures is dependent on the role that medical professionals, especially nurses, play in providing health care and

education (Vissarion, Malliarou, Theofilou, & Zyga, 2014). Therefore, nurses need to be updated with current knowledge on DSMES guidelines to better recognize the health condition of patients and to provide information about preventative and treatment strategies. In this project, I focused on educating clinical nursing staff at an outpatient clinic about the current evidence-based practice (EBP) guidelines based on DSMES by the ADA, to help the nurses increase patient knowledge to self-manage their diabetes. By equipping nurses to teach T2DM patients to self-manage, I aimed to contribute in solving the multi-faceted problem of non-compliance or non-adherence to self-management recommendations which may lead to complications, such as kidney failure, adult blindness, lower-limb amputations, and sometimes death due to cardiovascular morbidity. With effective patient self-management of their T2DM, the project could also contribute to the reduction of financial burden of this disease, which is projected at $336 billion annually in the US (ADA, 2017A).

Problem Statement

Non-compliance or lack of adherence to Diabetes Self-Management Education and Support (DSMES) recommendations is a major challenge when handling patients with T2DM since it leads to other health complications such as obesity, kidney failure, new cases of adult blindness, and lower-limb amputations (Wisse, 2014). T2DM is considered the seventh leading cause of death primarily due to cardiovascular morbidity in the US alone (World Health Organization, 2016).

I observed these health trends at a South Texas outpatient clinic where patients with T2DM were experiencing T2DM health complications. According to clinic leaders,

patient medical records showed that there are gaps in recommended protocols and practices in this clinic with regards to treatment of patients with diabetes. This is due to the fact that the primary care clinic practices a "one size fits all" treatment whereby patients are given the same medications for the disease. Additionally, the clinic admittedly does not use any evidence-based guidelines or interventions to treat T2DM. Furthermore, the clinic staff does not have the appropriate training and education that conforms with the recommended DSMES clinical guidelines as stipulated by the ADA.

With proper training, clinic staff can teach and encourage patients to self-manage the disease, and thus contribute to improvements of their health outcomes. The educational training included recommended individualized treatment guidelines that took into consideration different factors that may be affecting the lifestyle of patients with diabetes. I took into account various contributing factors, such as culture, genetics, sedentary lifestyle, socioeconomic, environmental and family dynamics to facilitate better clinical patient outcomes (Inzucchi et al., 2012). This project holds significance for the field of nursing practice as it is in direct response to the social mandate expected of nurses wherein they are encouraged to critically and respectfully challenge existing practices, examine new technology, and participate in new methods for the improvement of patient care (McCurry, Revell, and Roy, 2010).

Purpose Statement

The lack of staff training on DSMES in this clinic was a major gap-in practice, and the purpose of this Doctorate in Nursing Practice (DNP) project was to create an educational module to educate clinical nursing staff about DSMES using current EBP

guidelines. The goal of the module was to increase staff knowledge on T2DM, and assist staff in properly teaching and managing patients diagnosed with diabetes through patient education.

Management of diabetes is multi-faceted; it involves patient conduct of routine exercise, diet, weight control, regular glucose measurement, and medications (Inzucchi et al., 2012). It also involves participation of family members and support groups that can empower patients to continue with lifestyle changes (Beck et al., 2017). Such support groups should start at the medical facility where the health diagnosis was made. In this DNP project, I focused on determining if the implementation of a staff-education program, comprised of evidence-based self-management programs for patients with T2DM, can impact the knowledge of nurses in empowering their patients for T2DM self-care in an outpatient clinic in South Texas.

Specifically, the education module included patient lifestyle changes such as heathy lifestyle and diet choices and increased patient involvement in decision-making. The module aimed at educating nursing staff on the nature and state of T2DM and patient lifestyle modifications based on non-pharmacological and pharmacological treatment plan following DSME guidelines (Funnell et al., 2009). This program addressed the gap-in-practice, in that the clinic staff members were educated about promoting evidence-based diabetes self-management among the patients.

Nature of the Doctoral Project

Diabetes is a chronic disease that requires ongoing medical care (Wisse, 2014). Successful diabetes care included self-protection such as self-monitoring of blood

pressure and glucose, changes in lifestyles, and adherence to medication (Inzucchi et al., 2012). A lack of knowledge about how to properly instruct patients on self-care and educate patients has contributed to poor diabetes management at one outpatient clinic in South Texas. This is evidenced through observations in the clinic where patients were not provided with sufficient and appropriate information regarding self-management of their diabetes diagnosis. The long-term goal of this project is to provide staff education about lifestyle modifications and increase awareness of the importance of self-management of T2DM.

The project consisted of an educational program for staff members at an outpatient clinic. The project was designed to increase staff knowledge on diabetes self-management education for patients using the ADA and the American Association of Diabetes Educators (AADE) approved guidelines. Staff were asked to complete a pretest and posttest questionnaire to assess their knowledge on the content of the educational module. The educational module consisted of a presentation featuring facts about T2DM (nature and description, statistics, non-pharmacologic and pharmacologic treatments), based on Powers et al. (2015). The project has the potential to create positive social change that initially starts by providing nursing staff with current EBP guidelines about diabetes management. Nursing staff will be better prepared to teach patients to self-manage, thus promoting effective strategies that will lead to positive health outcomes of the patient, and potentially avert medically related complications that could lead to economic hardships.

Significance of this Project

Training nursing staff on evidence-based strategies involving diabetes self-management education and interventions will lead to quality care, promote health, and prevent complications of T2DM among patients, families, and the community. Implementation of the proposed educational plan of care, based on ADA and AADE approved guidelines, will have significant positive outcomes on the health of the patients, and potentially will reduce the economic burden of T2DM complications on the patients and their families. Promoting effective strategies to prevent T2DM could have a prophylactic impact to family members and individuals who are at risk of diabetes, and who have heard of preventative measures such as healthy lifestyle and proper nutrition, from the educational plan.

The project was a response to a gap in clinical practice regarding T2DM patients in an outpatient clinic in South Texas. As such, it was a demonstration of the social mandate described in McCurry, Revell and Roy (2010) where they encouraged nurses to be active participants in promoting and improving actions towards better patient health care. By equipping clinic nurses to teach patients how to self-manage their T2DM, I can empower nurses to be one of the supporters of patients in the improvement of patient health.

The project also has the potential to be easily replicated in other outpatient clinics with the same demographics. as the one in South Texas. It will involve staff training directed at T2DM patients who are predominantly adult/geriatric African Americans, Hispanics, and Asians. Other clinics with this same population could utilize the project

training program to empower their clinic staff to teach patient on self-management of their condition.

The project can also add towards the solution of non-compliance or non-adherence to self-management recommendations in T2DM. Diabetes is a manageable disease; however, failure to manage it has significant health consequences (such as obesity, kidney failure, adult blindness, lower-limb amputations) that can sometimes lead to death due to cardiovascular morbidity (Wisse, 2014). Consequently, these health complications usually result in additional financial burden to the patient, their families, and the government (World Health Organization, 2016). The project has potential implications for positive social change, which include reducing the occurrence of T2DM complications and the resulting financial costs.

Summary

In Section 1 of this DNP project, I presented an overview of diabetes, particularly T2DM, and the related health issues that arise from its occurrence and mismanagement. These health issues were apparent at an outpatient clinic in South Texas where patients were not provided with guidelines or interventions to treat their newly diagnosed disease. As a result, patients have been unable to manage their T2DM effectively. Additionally, staff members at the clinic did not have appropriate training on current evidence-based strategies using ADA and AADE approved guidelines. To address this gap in clinical practice, I aimed to educate the nursing staff about DSME. The project involved the creation of staff educational module that describes the nature and state of T2DM and patient lifestyle modifications based on non-pharmacological and pharmacological

treatment plan following DSMES guidelines. The aim of the module was to effectively teach clinic staff to teach patients how to self-manage their condition to prevent complications.

In the next section, I will discuss the background and content of the project including the supporting literature and theoretical framework for the project. Section 2 will also provide supporting evidence on the relevance of the project to nursing practice and the roles of DNP student

Section 2: Background and Context

Introduction

The identified practice problem at the outpatient clinic in South Texas involved the absence of provision of appropriate information on DSMES to patients with diabetes. Clinic staff had not been properly trained on current DSMES guidelines that help patients self-manage their diabetes. Given the knowledge deficit of staff, I created an educational module that educated nursing staff with current information on DSMES, thereby assisting in patient self-education and self-management of the disease. There are a number of concepts and theories that guided the development of the educational module. The first part of the chapter presents the conceptual models and theories related to improving the engagement of patient in the self-management program for adults with T2DM. In the second part of this chapter, I delve into further description of the proposed project by outlining its relevance to nursing practice, describing local background and context, and identifying my role.

Concepts, Models, and Theories

DSMES is the basic conceptual model behind ADA programs that are designed to improve the engagement of the patients in self-management programs. This concept is supported by a number of models, such as self-management and health model for chronic care, and theories such as self-regulation, dual process and social learning.

There are two models that support DSMES concept, the self-management model and the health promotion model. The self-management model, which is important for chronic conditions, is based on the systematic provision of supportive interventions and

evidence-based strategies that can increase the confidence and skills of the patients regarding the management of their condition (Iuga & McGuire, 2014). In addition, the evidence-based strategies on education and awareness about different interventions can assist patients as they are focused on regular assessment of the issues and defining goals for the problem. Several studies have shown that there is a need for improving the engagement of the diabetes patient to self-care programs because this engagement is required for regulation of different daily activities (Griffin et al., 2005; Matvienko & Hoehns, 2009). Through patient engagement with their self-care program, they can successfully live with diabetes (Wang et al., 2018).

Furthermore, the health promotion model (HPM) for chronic care also marks the need to increase awareness of T2DM patients about the health risks and complications of the disease as part of managing their disease (McCormack, Thomas, Lewis, & Rudd, 2017). Pender (2011) reported that the HPM has 14 major concepts that focus on

(a) Prior related behavior, that is the frequency of similar behavior in the past,

(b) Biological, psychological and sociocultural factors that has direct and indirect effect on behaviors,

(c) Personal biological factors: age, gender, body mass index, aerobic capacity, strength, menopausal, pubertal,

(d) Personal psychological factors such as self-esteem, self-motivation, definition of health, personal competence,

(e) Personal sociocultural factors: race, ethnicity, socioeconomic status, education, acculturation,

(f) Perceived benefits of action: anticipated positive outcomes,

(g) Perceived barriers to action: imagination, anticipated, personal cost,

(h) Perceived self-efficacy: personal capability and perceived barriers to action,

(i) Activity-related affect :positive or negative feelings,

(j) Interpersonal influences: beliefs, expectation of significant others, social support, families, peers, healthcare providers,

(k) Situational influences: personal perceptions, facilitators, health promoting behaviors,

(l) Commitment to a plan of action: identify planned strategy,

(m) Immediate competing demands and preference: alternative behaviors such as work, family care responsibilities, and lastly,

(n) Health promoting behavior action outcome: positive health outcome, healthy diet, exercising regularly, managing stress, and achieving optimal well-being. (p. 5-6)

The HPM is a theoretical model that fits the elements of the proposed staff educational training for quality improvement.

There are also different theories that support the above-mentioned models and that can be utilized in conceptualizing different evidence-based approaches to improve the proposed staff training in engaging T2DM patients. One of these theories is the self-regulation theory, which includes the presentation of different elements of the illness to the individual, and affects the emotional and behavioural responses of individuals towards their illness (Stenberg et al., 2018). One core element of this theory includes the

causative factors of diseases. Based on self-regulation theory, patients must also be presented with information about the causative factors associated with their chronic condition in order to provide them with effective treatments (Bates, 2018). In addition, patients are also guided about timeline and consequences of diabetes to demonstrate the impact of diabetes on the patient. The self-regulation theory also holds that patient must have known about the effectiveness of the treatment for curing and controlling their diabetes (Stenberg et al., 2018).

Another theory, the dual process theory, demonstrates the significance of self-monitoring. This theory can be used by healthcare providers for understanding and addressing the needs of the patients regarding the management of diabetes. This theory is effective in explaining the significance of education about the symptoms of diabetes and in using self-care approaches to manage their daily activities and their symptoms in case of unavailability of healthcare professionals (Chwastiak et al., 2017). The dual process theory also effectively explains the need for patient involvement in learning about the impact of disease on their bodies and the successful approaches to managing their daily activities or any emergency conditions (Bates, 2018).

The social learning theory is another theory that not only supports the significance of the self-regulation theory, but also recognizes the importance of various team members in the management of diabetes (Fan & Sidani, 2017). This theory emphasizes the importance of considering an individual's perception towards their diagnosis, and its enhancement, through learning, so they can develop confidence in the self-management of their condition (Kwan et al., 2017). It takes into account the need to redesign the

personal beliefs of patients to eliminate misconceptions and misunderstandings about the T2DM. Different team members can play a critical role in empowering the patients to self-regulate their behaviour, and in increasing patient knowledge about their symptoms (Fan & Sidani, 2017).

The various models and theories presented in the previous paragraphs point to the importance of self-engagement and self-management of chronic diseases such as T2DM. Such models and theories point to effective management of diabetes based on the patient's participation and improved learning about diabetes. Additionally, participation by different team members is necessary for successful DSMES. These points were essential elements that I factored in the creation of the educational staff training on T2DM.

Relevance to Nursing Practice

T2DM is a long lasting yet ceaseless health condition in which there is an abnormal state of sugar (glucose) in the blood (Wisse, 2014). It is the most widely recognized type of diabetes that is mainly linked with insulin defects (ADA, 2017A). Wisse (2014) describes that insulin is a hormone created in the pancreas by uncommon cells, called beta cells. The pancreas is beneath and behind the stomach, and insulin is expected to move (glucose) into cells. Inside the cells, glucose is put away and later utilized for vitality. According to Wisse (2014), when an individual has T2DM, his or her liver and muscle cells do not react effectively to insulin; this is called insulin resistance, and glucose does not get into these cells to be put away for vitality. At the point when sugar cannot enter the cells, an abnormal state of sugar develops in the blood, and this

condition is called hyperglycemia (Wisse, 2014). Many people with the sickness are overweight or corpulent when they are diagnosed (ADA, 2017A). Consequently, expanded fat level makes it difficult for the individual's body to utilize insulin the right way (Wisse, 2014). The symptoms of diabetes involve a more frequent or slow healing skin, kidney, bladder-related or other infections, hunger, weariness and expanded thirst (ADA, 2015; ADA, 2016b; ADA, 2017B).

T2DM is a chronic, yet manageable, disease. Successful diabetes care needs self-protection, including self-monitoring of blood pressure and glucose, changes in lifestyle, and adherence to medication (Powers et al., 2015). Self-monitoring of a patient with diabetes is particularly important for people with uncontrolled diabetes or diabetic complications (ADA, 2016a and 2016b). Nevertheless, self-management of diabetes is difficult and requires constant training and support through frequent contact with diabetes care managers and different staff such as recognized nurses who are practicing with doctors and other caregivers (ADA, 2015).

Management of this disease also includes regular medical examinations, exercise, healthy eating, regular self-glucose control, and specialist visits (Beck et al., 2017). Because of the seeming complexity of self-management, many patients fail to spot the recommended assessments and tend to rely on pharmacological therapy only (ADA, 2016a). However, reliance on one aspect, such as medication, has proven to be an ineffective and insufficient means to manage T2DM because it still leads to complications such as high blood sugar. Chrvala, Sherr, and Lipman (2016) found that changes in lifestyle were more effective than pharmacological treatment in treating and

preventing T2DM. Because of this, the researchers suggest that self-management would play a vital role in improving patient health condition and outcomes, than medication alone. Self-management is an integral part of the DSMES guideline that is currently recommended by the ADA in the treatment of T2DM.

Prior to the establishment of the current DSMES guidelines, diabetes management followed the six-step strategy developed by Rosswurm and Larrabee (1999) that focuses on improved outcomes and consisted of the following:

Step 1. Assess need for a change,

Step 2: Link problem with interventions and outcomes,

Step 3: Synthesize best evidence,

Step 4: Design a change in practice,

Step 5: Implement and evaluate the practice change,

Step 6: Integrate and maintain the practice change. (p. 320)

The six-step strategy provided an organized structure for health care professionals that is easy to use and allows for monitoring of different stages. The Rosswurm and Larrabee model was so effective that it had been utilized by the American Stroke Association and intensive care units (George & Tuite, 2008; Kavanagh, Connolly, & Cohen, 2006).

In the project by Kavanagh, Connolly, and Cohen (2006) with stroke patients, the researchers showed that the Acute Stroke Treatment Program, a model for change to EBP that is based on the six-step model by Rosswurm and Larrabee (1999), proved to be successful in improving health outcomes of patients. The researchers then suggested that the Rosswurm and Larrabee model could be applied to the improvement for disease-

specific populations such as patients with diabetes, through the use of EBP, teamwork, planning and collaboration. Patient self-management was highlighted as an important component in any successful diabetes management therapy. Specifically, the authors recommended patient education and self-management to control their blood glucose.

In this project, I factored in this element when formulating staff educational training that will bridge several gaps in practice observed at the South Texas outpatient clinic. At the said clinic, diagnosed patients were not provided with sufficient and appropriate information regarding diabetes management. Additionally, there was failure to follow up with patients in between initial diagnosis and quarterly visits. These resulted in frequent repeat patient visits that involved health complications. The goal of the module was to provide clinic staff with evidenced-based educational tools needed to facilitate patient adherence to self-management interventions with regard to their T2DM. Through this, patients can achieve improved physical and emotional well-being despite their T2DM (see Chwastiak et al., 2017). The study will also contribute to knowledge in the nursing field. Specifically, the proposed educational module can be utilized as a guideline for implementing future education courses for nurses on T2DM management.

Local Background and Context

According to World Health Organization (2016), T2DM is the most common type of diabetes, and a major cause of blindness, heart attacks, stroke, kidney failure, and lower limb amputations. This trend is prevalent at a south Texas outpatient clinic where nearly 55% of walk-in patients are either diabetic and hypertensive or sometimes both. Unfortunately, the primary care practice treatment practice does not conform with

recommended clinical guidelines as stipulated by ADA. The primary care clinic practices a "one size fit all treatment strategy versus the recommended individualized treatment guidelines that takes into consideration different factors that may be affecting lifestyle of patients with diabetes (ADA, 2017A). Specifically, treatment practices lacked the following: (1) patient teaching based on printed handouts given to newly diagnosed patients, (2) on-going education and follow-up evaluation of patients after they leave the clinic until next appointment, (3) family member participation and encouragement from staff, and (4) multidisciplinary collaboration. These aspects are key in improving health of patient with diabetes. So, I initiated staff teaching on DSMES strategies that has the potential of increasing and facilitating patients' engagement in self-management interventions. The end goal was to improve patient self-care regarding their health condition.

I designed the educational program to take place at a South Texas clinic with six treatment rooms, two triage rooms, a laboratory room and reception area. It houses three private offices including one for the medical doctor (MD), one for the staff Nurse Practitioner (NP), and one for miscellaneous personnel. The clinic manages patients with chronic conditions mainly diabetes, hypertension, and heart failure. However, the clinic also sees some patients with mental health disorders such as depression and anxiety, and acute conditions such as cold, cough, minor cuts and injuries. In total, the clinic has approximately eight hundred active patients, of which about three hundred have T2DM, most of which are African Americans and Hispanics.

Clinic staff is comprised of one MD, two NP, one registered nurse (RN), one licensed vocational nurse (LVN), four medical assistants (MA) and one receptionist. The clinic often has NP and PA students who may assist in the daily clinic activities. The LVN is the office manager/patient care coordinator. I presented the educational program to eight staff members – four MA, two NP, one RN, and one LVN, during their lunch hours. During this time, I presented handouts and the floor was opened for discussion, with the goal of bridging staff knowledge gap on teaching and encouraging T2DM patients on self-management of their chronic condition.

The project was consistent with the DSMES guidelines recommended by the ADA (2015, 2016 A, 2016 B, 2017 A, 2017 B). The Centers for Disease Control and Prevention (CDC) also recommends DSMES that focuses on medical access, health care provider referrals and cost reimbursement (CDC, 2018).

Role of the DNP Student

I am the initiator of the staff education project which was implemented at a clinic in South Texas where I performed my year-long practicum as part of the requirement in the DNP program. During that time I observed a gap in clinical practice with regards to their treatment of T2DM patients. There was an absence of patient teaching and follow up after medical appointment, and lack of clinic staff participation and multidisciplinary encouragement on patient self-management of their T2DM. These resulted in many repeat visits of patients complaining of health complications from diabetes. Because of these, I developed this project on staff educational training to-empower patients to self-manage their T2DM. The proposal-for evidence-based strategies designed for increasing

the engagement of the diabetes patient in self-care with the goal of improving the quality of care and life of the patient.

As the DNP student, I had the primary role in developing the educational program. I conceptualized a clinic staff training tool that aims to engage patients with practical tools and techniques which are required for self-management (Fan & Sidani, 2018). This eventually assisted the patient to improve their understanding about self-care programs and ensured their involvement in different daily activities required for managing their conditions (Stenberg et al., 2018)

My observation of the gap in clinical practice motivated me to develop a training program based on DSMES guidelines. Despite being in the clinic for only a year, as a DNP student, I was able to observe that the clinic does not have a strategy in place to help patients who were diagnosed with T2DM, other than prescribing medications. The absence of clinic strategy was not due to the lack of desire to help patients, but was due to insufficient number of staff to attend to the needs of many patients. During my one-year stay at the clinic for my practicum, I was extending help to the staff, as much as I can to meet patient needs.

The potential bias I have revolved around my limited stay at the clinic and my interaction with patients. Because I was only a DNP student at the clinic, my work hours were not regular, so my time to provide a more thorough observation about clinic practices was very limited. Despite this, I maximized my short stint at the clinic by staying long hours in a day so that I was able to get a wholistic view of daily activities. As for patient interaction, I was able to talk with patients while assisting them during a

check-up, and realized big differences between lifestyles and beliefs. Despite these differences however, I provided them with a listening ear that helped them make decisions that are beneficial to their health. These experiences factored in my desire to formulate staff education program on T2DM.

Summary

In Section 2, I provided a summary of supporting models and theories of DSMES, as well as clarified my role in the development of the proposed staff educational training. I also stipulated a brief summary of the local clinic and the gap-in-practice which led to the development of the proposal. In Section 3, I will then describe the methodology involved in the implementation of the project.

Section 3: Collection and Analysis of Evidence

Introduction

T2DM is a chronic, yet manageable, disease. Its management is dependent on a multi-faceted program that hinges on medical staff supervision and patient self-management (Inzucchi et al., 2012). Failure in managing the disease can lead to more, if not worse, health complications. Unfortunately, this scenario is a sad reality observed in a clinic facility in South Texas where diagnosed T2DM patients were released following the clinic's "one size fits all" practice, only to come back with more health complications. Clearly, this is a gap in clinical practice, which I aimed to bridge in this project.

Section 3 outlines the literature I reviewed that provides support for the efficacy of DSMES in helping T2DM patients manage their chronic condition successfully. I highlight the multidimensional aspect of patient care because this was the aspect that compelled the creation of the educational module. I then summarize methodology to indicate the steps that I followed.

Practice-focused Question

In an outpatient clinic in South Texas, the lack of clinic staff education on encouraging T2DM patients to self-manage their chronic condition yielded repeat visits of patients with worse health conditions than their initial diagnosis. This situation can be prevented if clinics such as the study site could customize their patient care and not practice a "one size fits all" routine. Thus, I aimed to bridge the gap in clinic practice by creating an educational module to educate clinical nursing staff about DSMES using current EBP guidelines in order to increase staff knowledge on T2DM, and to assist them

in properly teaching patients to self-manage their diabetes. I aimed to answer the practice-focused question:

> How can a staff-education intervention comprising of evidence-based self-management programs for patients with T2DM impact the knowledge of nurses in an outpatient clinic, in empowering their patients for self-care?

By empowering patients with the appropriate facts and practices based on their particular profiles, clinic staff can better encourage patients and their families to make realistic steps towards successfully managing their diabetes.

Sources of Evidence

I reviewed literature for pertinent information on T2DM and the DSMES guidelines, which formed the foundation for the educational module. The literature provided a cohesive view of how using DSMES guidelines can contribute to encouraging T2DM patients to self-manage their chronic condition through education of clinic staff.

T2DM requires the regulation of daily activities; therefore, self-management programs are required (Beck et al., 2017; Powers et al., 2015). DSMES is one of the evidence-based strategies that can be used to increase the engagement of the patient to self-management. Researchers have considered this evidence-based strategy significant because it provides the basis for helping people with diabetes navigate and regulate their activities and decisions, and it ensure management of their condition, thus bringing improvements in the health outcomes (Bates, 2018). For example, Sternberg et al. (2018) reported that DSMES provided the support needed for the implementation and sustainability of coping behaviors and skills for ensuring that patient can continuously

self-manage their daily activities. These reports show that DSMES is the strategy based on the facilitation of patient knowledge, ability, and skills, which are required for the engagement of a T2DM patient to self-care.

Published Outcomes and Research

This project involved the creation of an educational module on diabetes aimed at educating staff about its proper management through lifestyle modification based on DSMES guidelines. I searched the following databases to search for information related to background information on DSMES and the design of educational module: the Cumulative Index to Nursing and Allied Health Literature (CINAHL), MEDLINE with Full Text, Ovid Nursing Journals, ProQuest Nursing & Allied Health Source, Cochrane Database of Systematic Reviews, Database of Abstracts of Reviews of Effects (DARE). The databases contained systematic reviews, evidence summaries, clinical research, best practices, evidence-based articles, journals, and e-books on variety of nursing, and healthcare and medical information that provide background and supplemental information about T2DM, DSME and the proposed educational modules. Keywords I used for literature search included: *evidence-based practice guidelines, type 2 diabetes management, individualized self-management interventions, self-management programs, health prevention, health promotion model, stages of change model, sedentary lifestyle,* and *challenges of managing type 2 diabetes*. The search was limited to articles and journals from 2005-2018; over 250 articles were retrieved.

Diabetes self-management education and support. DSMES remains the most proven evidence-based treatment strategies that if practiced as recommended, will

facilitate quality care, promote health, and prevent complications of T2DM among the patients, families, and community (ADA, 2016b). Implementation of this educational plan of care using ADA and AADE approved guidelines will significantly have positive outcome on the health of the patients, and in-turn reduce the economic burden stemming from T2DM complications (Powers et al., 2015).

DSMES Standards. The DSMES stipulate 10 national standards that are meant to maximize care and support for patients with diabetes. Beck et al. (2017) outlined the most current version as follows:

- Standard 1: Internal Structure. The provider(s) of DSMES services will define and document a mission statement and goals. The DSMES services are incorporated within the organization—large, small, or independently operated.
- Standard 2: Stakeholder Input. The provider(s) of DSMES services will seek ongoing input from valued stakeholders and experts to promote quality and enhance participant utilization.
- Standard 3: Evaluation of Population Served. The provider(s) of DSMES services will evaluate the communities they serve to determine the resources, design, and delivery methods that will align with the population's need for DSMES services.
- Standard 4: Quality Coordinator Overseeing DSMES Services. A quality coordinator will be designated to ensure implementation of the Standards and oversee the DSMES services. The quality coordinator is responsible for all components of DSMES, including evidence-based practice, service design, evaluation, and continuous quality improvement.

- Standard 5: DSMES Team. At least one of the team members responsible for facilitating DSMES services will be a registered nurse, registered dietitian nutritionist, or pharmacist with training and experience pertinent to DSMES, or be another health care professional holding certification as a diabetes educator (CDE) or Board Certification in Advanced Diabetes Management (BC-ADM). Other health care workers or diabetes paraprofessionals may contribute to DSMES services with appropriate training in DSMES and with supervision and support by at least one of the team members listed above.
- Standard 6: Curriculum. A curriculum reflecting current evidence and practice guidelines, with criteria for evaluating outcomes, will serve as the framework for the provision of DSMES. The needs of the individual participant will determine which elements of the curriculum are required.
- Standard 7: Individualization. The DSMES needs will be identified and led by the participant with assessment and support by one or more DSMES team members. Together, the participant and DSMES team member(s) will develop an individualized DSMES plan.
- Standard 8: Outgoing Support. The participant will be made aware of options and resources available for ongoing support of their initial education, and will select the option(s) that will best maintain their self-management needs.
- Standard 9: Participant Progress. The provider(s) of DSMES services will monitor and communicate whether participants are achieving their personal diabetes self-

management goals and other outcome(s) to evaluate the effectiveness of the educational intervention(s), using appropriate measurement techniques.

- Standard 10: Quality Improvement. The DSMES services quality coordinator will measure the impact and effectiveness of the DSMES services and identify areas for improvement by conducting a systematic evaluation of process and outcome data. (p. 1410-1415)

The DSMES standards provide structure for patients in the implementation and sustenance of multiple actions and services that assist in self-managing their chronic condition on a continuous basis. They are patient-based and multi-faceted so involve different avenues that are necessary for the patient to consider in self-managing their diabetes. These includes, but are not limited to, electronic health tools, online peer support, and health care support team which may include solo primary care providers, large multicenter health programs, or even technology-based approaches such as virtual doctor visits. DSMES standards also recognizes that there are four critical time elements for providing self-management education – at initial diagnosis of diabetes, at annual check-up, when complications occur, and during transitions in care. All these time points are essential times to introduce or reinforce self-management education opportunities for the patient. DSMES also meet, if not surpass, the Medicare diabetes self-management training (DSMT). However, DSMES do not guarantee Medicare reimbursement.

Benefits of DSMES. Research has shown that DSMES provides numerous clinical, psychosocial, and behavioral benefits for T2DM patients, including improved hemoglobin A_{1c} (Hb A_{1c}; Powers et al., 2015). It has also been reported to improve the

patients' quality of life through lifestyle changes such as engaging in healthful eating pattern, and regular physical activity, thereby resulting in enhancement of their coping ability, self-efficacy and empowerment (Tang, Funnell, & Oh, 2012). Researchers have also reported that patients' improved way of coping with their chronic condition via DSMES have significantly affected the onset and/or progression of diabetes complications (The Diabetes Control and Complications Trial Research Group, 1993). Hospital admissions and readmissions are reduced and/or prevented, thereby making DSMES a cost-effective tool (Powers et al., 2015). Because of the numerous researches documenting the positive impact of DSMES, the ADA strongly encourages patients with diabetes to undergo DSMES at point of diagnosis and as needed.

Because of its efficacy, alternative modes of DSMES delivery are encouraged by ADA. In addition to the formal programs at outpatient facilities where patients and their families are referred to participate, the ADA suggests that alternative modes should also be set up to maximize participation from T2DM patients and their families. Alternative settings could include medical offices, medical homes, community health centers and pharmacies, and even through technology-based programs. Through these different settings, DSMES is more readily available and affordable (Powers et al., 2015).

Evidence Generated for the Doctoral Project

Planning and Implementation. I saw the need to create an educational module through my observation of gaps in clinical practice involving patients with diabetes in the study site. Diagnosed patients were not provided with appropriate support following their medical check-up, except for a simple handout only, with no explanations. The result is

repeat patient visits due to complications. Therefore, I developed an educational module for staff that was directed towards teaching patients about self-management of their T2DM. The module was composed of an hour-long presentation with lecture and handouts about current diabetes information and management guidelines, and pre- and post-test assessments of staff participants to assess their diabetes knowledge before and after exposure to module. Assessments were in the form of survey questionnaire based on 13 close-ended questions that can be answered by "Yes" or "No" answers. Evaluation questions revolved around categories discussed in Peyrot et al. (2007) who developed diabetes self-management assessment tools that cover the following topics: benefits, risk and management options for improving glucose control and diabetes in general, and pharmacological and non-pharmacological interventions such as weight management, meal plans, physical exercise (and sedentary activities), stress management, family and social support (health care and community resources).

Participants. I presented the module to eight clinic staff composed of four medical assistants, two NP, one RN and one LVN. All participants were asked to fill out a pre-module presentation survey to establish baseline knowledge on diabetes and diabetes care. Immediately after the module presentation, participants were required to answer a post-module presentation survey to determine information that they remember and acquired from the module.

Procedures. The educational module was an hour-long presentation using Microsoft PowerPoint program and handouts that showed current information on diabetes in terms of pharmacological and non-pharmacological self-management by patient

(Appendix A). I presented the module to the nursing staff, who underwent pre- and post-test survey questions to determine their understanding of the material on current DSMES guidelines. Lecture presentation was adapted from Powers et al. (2015) and presented current information on DSMES guidelines. Throughout the presentation, I emphasized the critical intervention that can be made by nursing/medical staff towards assisting T2DM patients with regard to self-management of their condition. I also provided additional handouts based on the presentation to reinforce the importance of active staff intervention in encouraging and teaching patients to self-manage their disease at different time points of T2DM diagnosis (Appendix B). I asked participants to fill out the pre-test survey before listening to the lecture (Appendix C). After the lecture, I requested participants to answer a post-test survey and gave a handout as summary of what they learned (Appendix D).

Survey questions revolved around knowledge of participants about benefits, risk and management options for improving glucose control and diabetes in general, and pharmacological and non-pharmacological interventions such as weight management, meal plans, physical exercise (and sedentary activities), stress management, family and social support (health care and community resources). Participant answers were based on close-ended questions that are answerable with “Yes” or “No” (Appendix C and D). There were five questions that pertain to the benefits, risks and management options for improving glucose control. Only one question revolved around pharmacological management. Additionally, there were seven questions that involved non-pharmacological interventions that a patient should be encouraged to perform in order to

manage their condition. In particular, survey questions in this category included follow up inquiries with staff on their discussion with patient regarding patient weight and exercise management, physiological care such as regular eye exam and foot care, diet plans, stress management, and available health and community resources and support that could help in patient self-management of diabetes.

Protections. I reviewed the necessary Human Protection course/program, as recommended by Walden University IRB, before conducting staff survey. IRB approval was secured and approved (#03-19-19-0412923). The Site Agreement was also submitted for approval before initiation of the project. All documents, data, and information from the staff survey were confidential and anonymous. I gave each staff member a Consent Form for Anonymous Questionnaires before commencement of the module survey questions. The consent form stated that participation is voluntary and confidential. Anonymity was further established by assigning numbers on pre- and post-test forms instead of identifying names of participants. Study results will be kept in a secure location for five years, as per IRB requirements.

Analysis and Synthesis

I summarized pre- and post-test results based on staff knowledge of benefits, risk and management options for improving glucose control and diabetes in general, and pharmacological and non-pharmacological interventions such as weight management, meal plans, physical exercise (and sedentary activities), stress management, family and social support (health care and community resources). Data results were in binomial form ("Yes" for correct and "No" for incorrect answers). Data were also dependent because

they were taken from the same set of individuals who were evaluated at different time periods. Binomial answers were converted to binary form so appropriate statistical techniques can be performed, using Microsoft Excel. Frequency distribution was used to summarize the results. McNemar test, a form of Chi-square test appropriate for paired, binary data, was used to determine the impact of the module to the participants' professional practice in terms of teaching patients how to self-manage their T2DM condition (Fleiss, 1981).

Pre-test results described the clinical gap in practice of staff in teaching patients with diabetes. Post-test results showed efficacy of the educational module through comparison of participant answers before and after module presentation. Study sample size, $N = 8$, for staff survey, was small because it was from one outpatient clinic only. Outliers were not possible because of the binomial nature of the data.

Summary

In Section 3, I presented literature review on DSMES, the foundation of the proposed educational staff training which addressed the gap in clinic practice with regards to T2DM patient self-management. DSMES will bring positive social change to the stakeholders. As patients learn and/or improve their self-management of diabetes, there will be less health complications and lower financial burden as well. Patient learning starts with educating clinic staff about DSMES. This will not only provide current information on diabetes, but most importantly, it will have a positive impact on patient health outcomes.

In this section, I also showed the details of the project's participants, procedures, and data analysis. Project details pointed to the ways in which DSMES guidelines can be utilized by staff to empower patients to look into their unique lifestyles and belief systems to manage their condition. For the next section, I will quantify the results and discuss the findings and implications.

Section 4: Findings and Recommendations

Introduction

This project stemmed from the gap in practice related to current DSMES staff management guidelines of the staff at an outpatient clinic in South Texas. The primary care clinic did not follow ADA's recommended treatment guideline strategy that is based on an individual's lifestyle pertinent to his/her diabetic condition. Specifically, the clinic's treatment practices lacked the following: (a) patient teaching based on printed handouts given to newly diagnosed patients, (b) on-going education and follow-up evaluation of patients after they leave the clinic until next appointment, (c) family member participation and encouragement from staff, and (d) multidisciplinary collaboration. According to ADA and AADE, the absence of these aspects of care pose a problem in the effective treatment of T2DM (ADA, 2015; ADA, 2016a; ADA, 2017B; AADE, 2010). To assist the clinic in improving their T2DM treatment guidelines, I developed a staff education on DSME strategies to bridge the gap in clinic practice. Staff education is an important component in the DSMES standards as explained in Beck et al. (2017). The staff education module aimed to answer the practice-focused question:

> How can a staff-education intervention comprising of evidence-based self-management programs for patients with T2DM impact the knowledge of nurses in an outpatient clinic, in empowering their patients for diabetic self-care?

The purpose of the module is to educate clinical nursing staff regarding DSME using current EBP guidelines in order to increase staff knowledge on T2DM, and assist them in

properly teaching patients to self-manage their diabetes. The end goal was to improve patient self-care regarding their health condition.

Eight participants provided their consent to participate in the module which consisted of a lecture presentation and pre- and post-lecture survey questions. Data were based on participant responses about their agreement/disagreement on 13 pre and post-lecture questions that revolved around the benefits, risk and management options for improving glucose control and diabetes, and the pharmacological and non-pharmacological interventions to control T2DM, such as weight management, meal plans, physical exercise (and sedentary activities), stress management, family and social support (health care and community resources). I used descriptive analyses of binomial data to quantify clinical gaps in practice of staff in teaching diabetic patients, and to show efficacy of the educational module through comparison of participant answers before and after module presentation. Specifically, frequency distribution was used to summarize the results, and McNemar's test was used to determine impact of the module to participants' professional practice in terms of teaching patients how to self-manage their diabetic condition.

Findings and Implications

The DNP project entailed the presentation of an educational module (Appendix A) that is derived from evidenced-based strategies of DSMES, and directed at clinic staff at a South Texas outpatient clinic. The module was presented to clinic staff ($N = 8$) and they were asked to participate in pre- and post-test survey questions. Results are

presented in Tables 1 and 2, and are explained based on staff knowledge about the nature and state of T2DM, and lifestyle modifications.

Staff Knowledge on Nature and State of T2DM

Questions 1, 3, 4, 7 and 13 pertained to staff knowledge about benefits and management options for improving glucose control, and the risks and complications associated with diabetes (Table 1). In the tables below, the star mark (*) signifies significant differences, while *n.a.* signifies non-significant differences.

The result of data analysis presented in Table 1 shows that there were no statistically significant differences in answers between pre- and post-test survey for questions 1 and 13, respectively. This reveals that staff were already evaluating patients' knowledge of diabetes, and its management during each clinic visit, as well as teaching patients about T2DM complications and ways to avoid them.

However, the other three questions in the table pertaining to management options for improving diabetes show statistically significant differences in answers between pre- and post-presentation of module (Table 1). All the participant responses were negative, with the exception of Question 4 (on goal setting), which had one respondent (12.5%) whose response on the pre-test indicate that she taught patients how to set goals. With the significance levels ranging between .013 and .023 on those three items ($p < 0.05$), it is obvious that the presentation of the module improved their knowledge on the aspects of teaching patients how to access resources and how to set goals for improvement of their health condition (Table 1**).**

Table 1

Survey responses involving staff knowledge on nature and state of T2DM (N = 8)

Question #	Test Survey	Responses "Yes"	Responses "No"	McNemar's test ($p < 0.05$)
1. Checking patients' knowledge of diabetes, and how to manage it				
	Pre-	100.00%	0.00%	n.a.
	Post-	100.00%	0.00%	
3. Teaching patients about access to resources for self-management of diabetes				
	Pre-	0.00%	100.00%	0.013*
	Post-	100.00%	0.00%	
4. Teaching patients about setting goals for diabetic management				
	Pre-	12.50%	87.50%	0.023*
	Post-	100.00%	0.00	
7. Teaching difference between daily blood glucose value & A_{1c} Glycohemoglobin value				
	Pre-	0.00%	100.00%	0.013*
	Post-	100.00%	0.00%	
13. Teaching about complications of diabetes and how to avoid them				
	Pre-	87.50%	12.50%	1.00
	Post-	100.00%	0.00%	

Staff Knowledge on Lifestyle Modifications

Staff knowledge about DSMES guidelines involving pharmacological and different non-pharmacological interventions such as weight management, meal plans, physical exercise (and sedentary activities), and stress management were tested using Questions 2, 5, 6, 8 to 12 (Table 2). Relationships between pre- and post-lecture presentation showed varying trends in staff responses, and will be discussed based on their statistical significance.

Staff teaching on exercise requirements and different types of exercises that patients can perform did not show a statistically significant difference between the two different time periods ($p = .248$ on Question 2). Before module presentation, the three medical assistants (37.5%) answered "No" for Question 2 because they were unaware

that these areas need to be discussed with patients. However, after the lecture, they agreed that discussing the types and requirements of exercises that patients can perform is an important aspect of patient management program.

Staff knowledge on weight management (Question 5) and blood glucose monitoring (Question 6) also showed statistical non-significance between participant answers before and after module presentation (Table 2). For Question 5, there was no change in staff responses at pre- and post-lecture. Specifically, discussion of weight management strategies with patients was a difficult area to address among the three medical assistants, before and after the lecture, which is evident in the 37.50% "No" response for Question 5 (Table 2). However, the rest of the clinic staff answered that they had already been discussing weight management with T2DM patients even before the module; therefore, the lecture only reiterated the importance of what they were already doing to help improve patient condition. It is notable that 62.50% of staff answered "Yes" at pre- and post-lecture (Questions 5). Additionally, discussion with patients about blood glucose monitoring is an event that clinic staff was already doing, pre-lecture, with the exception of one medical assistant (12.50%). However, after module presentation, all clinic staff agreed on the significance of discussing this aspect with T2DM patients. Despite this, there was no statistically significant differences in staff responses on teaching patients about blood glucose monitoring, before and after the lecture ($p = 1.00$).

The module showed improvement in staff knowledge regarding annual eye exams, foot care, stress management and meal plans, and was supported by statistically significant differences in responses (Table 2). Before the module, the two NPs (25%)

answered positively on teaching patients about conduct of annual eye exams and foot care, and meal planning; while the remaining 75% of the participants were not communicating these areas with patients.

In the aspect of stress management, all participants were unaware of the inclusion of this topic in patient treatment before lecture. But after the implementation of the module, all of their responses were positive for Questions 8, 9, 11 and 12 which indicated their agreement in including these aspects in patient care. With significance levels ranging from .013 and .041 ($p < 0.05$), these four aspects show the utility of the module in increasing staff knowledge on these areas.

The single question on pharmacological management (Question 10) showed that only 37.50% of staff (two NPs and one RN) answered positively before the lecture, while all answered "Yes" after the presentation (Table 2). It seemed that the rest of the staff gained some knowledge from the module implementation. However, these differences in frequency responses were still not statistically significant ($p = .074$).

Table 2

Survey responses involving lifestyle modifications (N = 8).

Question #	Test Survey	Responses		McNemar's test ($p < 0.05$)
		"Yes"	"No"	
2. Teaching patients exercise types and requirements				
	Pre-	62.50%	37.50%	0.248
	Post-	100.00%	0.00%	
5. Teaching patients about weight management strategies				
	Pre-	62.50%	37.50%	n.a.
	Post-	62.50%	37.50%	
6. Teaching about monitoring blood glucose				
	Pre-	87.50%	12.50%	1.00
	Post-	100.00%	0.00%	
8. Teaching about the importance of getting an annual eye exam				
	Pre-	25.00%	75.00%	0.041*
	Post-	100.00%	0.00%	
9. Teaching about the importance of routine foot care				
	Pre-	25.00%	75.00%	0.041*
	Post-	100.00%	0.00%	
10. Discussing self-management of their medications				
	Pre-	37.50%	62.50%	0.074
	Post-	100.00%	0.00%	
11. Discussing stress management				
	Pre-	0.00%	100.00%	0.013*
	Post-	100.00%	0.00%	
12. Teaching about meal planning				
	Pre-	25.00%	75.00%	0.041*
	Post-	100.00%	0.00%	

Overall, the results show the utility of the module in highlighting areas which the staff need to work on. Specifically, all the clinic staff learned that part of DSMES is teaching patients how to access resources that will assist them in their T2DM self-management, what the difference between daily blood glucose and A1c glycohemoglobin test values are, and how to manage their stress levels. In addition, most of the staff, with the exception of the two NPs, learned that they need to teach T2DM patients about goal

setting, weight management, blood glucose monitoring, annual eye exams, routine foot care, self-management of medications, and meal planning.

The study results also revealed some unanticipated outcomes pertaining to areas of strength by staff. For one, the study showed that the two NPs seemed to know the guidelines more than any of the other staff. This was evidenced by their consistent positive answers in the pre-lecture survey for most of the questions. Another area of strength by the staff involved topics that staff have already been asking and teaching patients about. These include topics on patient knowledge of diabetes and its management, complications and how to avoid them, blood glucose monitoring, exercise and weight management of patients (Questions 1, 2, 5, 6, 13). In these questions, more than half of the staff answered positively when asked whether they taught patients about these topics, even before module implementation.

The module seem to provide assistance in increasing staff knowledge about DSMES guidelines. If performed on a regular basis, as suggested by ADA (2015), the module can strengthen staff information and further increase their competency in providing support to patients in self-management of their health conditions. Patients with T2DM can then be equipped to self-manage their condition by being pro-active in instituting changes in their lifestyle that will improve their health. Inzucchi et al. (2012) reported a similar trend and concluded that successful diabetes care involved patients who showed the initiative to take steps towards healthy lifestyle choices and adherence to medication. With improved health, they are more likely to improve their emotional well-being and live productive lives (Wang et al., 2018).

Altogether, study implications are not only interconnected actions that will result in improved well-being of patients, they also lead to reduction in health care costs (ADA, 2017A). The short-term positive impact of this DNP project is the increase in knowledge and competency of clinic staff to provide effective support to patients. This will likely have long-term positive implications on improving physical, emotional and financial health of the patients and their families.

Recommendations

I created and presented an educational module based on evidenced-based DSMES to clinic staff in response to the gap in practice observed at the clinic in south Texas. In particular, the practice setting provided insufficient patient teaching, follow up evaluation, and multidisciplinary collaboration which are essential components in improving T2DM patient health condition (ADA, 2015; ADA, 2016a; ADA, 2017B; AADE, 2010). Therefore, I developed the staff education module to fill the gaps in practice following the dual process theory described by Chwastiak et al. (2017) who pointed out the significance of healthcare provider education in the management of diabetes. Overall, the module provided an educational intervention that showed the strengths and weaknesses of staff knowledge on DSMES guidelines. Based on these results, I am highly recommending that an on-going support system be developed in the clinic, so that the newly established DSMES initiatives will continue, both for the short- and long-term period.

I also recommend that regular staff training be resumed to keep staff knowledge current, following the DSMES standards in Beck et al. (2017). This would particularly be

helpful for the medical assistant and LVN positions who displayed the most amount of knowledge gained from the proposed module. Alternatively, the two NPs came out to be the most knowledgeable on the guidelines. Therefore, the clinic administration should encourage NPs to lead regular future staff training. The module could also be presented to new staff hired at the clinic to keep DSMES standards uniform with current staff. Both practices can provide better support to patients newly diagnosed with diabetes and those who will be coming back for follow-up.

The clinic would benefit from creating a support group that will meet either weekly or every two weeks in form of orientation section for new and existing patients diagnosed with type two diabetes. Regular progress review, or Standard 9, is another important component outlined in the DSMES standards that deals with monitoring of patient progress in achieving goals and improving health outcomes (Beck et al., 2017). For example, during the group session, patient questions should be addressed and answered including those that relate to psychosocial issues affecting their lives and efficient utilization of outside resources. The discussion will allow for a more personalized treatment plan that is unique to the patient's progress, and thus will be more realistic for the patient to achieve (Funnell, Tang & Anderson, 2007). This weekly or biweekly clinic group visit should be followed by a telephone follow-up call or an email to get patient feedback and allow opportunity for a one-on-one clarification, if any. The clinic could utilize the NP to potentially lead this endeavor as study results revealed that they are the most competent staff in terms of their knowledge on DSMES guidelines.

Patients should be encouraged to invite their family and supporters, as desired, to attend the orientation section. This is in line with DSMES Standard 8 where it is stated that additional resources can provide patient support. Orientation discussion should focus on self-efficacy and problem solving. DSMES should be reinforced during each group session. Gaps should be identified and addressed appropriately using the DSMES module. In addition, patients' personal goals and progress need to be assessed and documented at different intervals. It is important to assist patients to care for themselves by using diabetes education tools during every visit by presenting to them a brief explanation on complications of diabetes and measures to prevent and avert a negative outcome in order to promote healthy outcomes.

Finally, I further recommend that social support through family, friends, and community involvement should be continuously encouraged by clinic staff, in order to promote healthy outcomes for diabetic patients. This is consistent with the approved guidelines set forth by the AADE (2010) where the association recommended the participation of patient support groups to assist in patient management of their T2DM condition.

Strengths and Limitations of the Project

I presented an educational module based on evidenced-based DSMES to clinic staff in response to the gap in practice observed at the clinic in south Texas. Overall, the module was deemed useful by the current staff in terms of teaching patients about the following: (a) how to access resources that will assist them in their T2DM self-management, (b) what the difference between daily blood glucose and A_{1c}

glycohemoglobin test values are, and (c) how to manage their stress levels. Additionally, most of the staff learned that they need to teach T2DM patients about goal setting, weight management, blood glucose monitoring, annual eye exam, routine foot care, self-management of medications, and meal planning.

The module seemed to also reiterate current staff knowledge on some of the guidelines. Specifically, the module seem to indicate that the staff were already knowledgeable about diabetes management and complications (and how to avoid them), as well as blood glucose monitoring, exercise and weight management of patients. They were already teaching these topics to patients. In this regard, the module also showed that the staff was competent about specific areas of the DSMES guidelines. Also, the module also showed that the NPs are the more knowledgeable among the clinic staff.

The module was presented to a clinic with staff size of eight. The sample size of eight can be considered both a strength and limitation**.** A small sample size allowed for ease in conduct of the study so that the researcher was able to communicate with respondents with no difficulty. On the other hand, a small sample size is also a limitation because the power of the statistical test may be compromised so that differences between populations are undetectable (Rao, 1998). Test results then need to be interpreted with caution (Fleiss, 1981).

Another limitation of the study design involved the frequency of the study. The module was only performed at one time. Regular staff training and data gathering would have been ideal to determine the long-term utility of the module. The study design also did not test the direct impact of the module to the patients. Future modules could include

patient input regarding information that they received from the staff. This aspect could provide proper accountability on transfer of knowledge that improves patient health condition, from staff to patient.

Section 5: Dissemination Plan

I recently presented the results to the clinic administrator, clinic manager, assistant manager, RN and LVN who were appreciative of the knowledge on the specific aspects that will assist the clinic staff on how to be more efficient in educating T2DM patients in the self-management of their health condition. The clinic and the DNP student agreed on the former's use of the module in training new staff so they can continue to assist T2DM patient education and follow DSMES guidelines. The administrator will be responsible for future implementation of the module in the clinic. Further training of new staff and regular training of current ones are needed to maintain and equip them to provide quality patient care for T2DM patients. The clinic will follow the same protocol outlined in this research that included a 1-hour training session, held at lunch break, using PowerPoint slides (Appendix A) and handouts (Appendix B). A pretest questionnaire (Appendix C) would be given to the staff to fill out before listening to the lecture so clinical staff's current level of knowledge about diabetes and their attitudes towards patients diagnosed with diabetes can be checked. A posttest questionnaire (Appendix D) would be distributed after the module training to assess how the training has improved their knowledge. Copies of the PowerPoint manuscript would be distributed individually to each attendee for reference.

Based on the positive results that I presented during a recent visit back to the clinic, the manager produced an educational brochure based on the lifestyle modification information that is part of the staff educational module. Brochures were made available in the lobby for patients, families and visitors to bring home as information reminder, after

receiving DSMES-based support from clinic staff. The clinic manager has plans to translate the brochures in Spanish to accommodate their Hispanic patients and to share the brochure to interested individuals during community outreach activities.

The results of the study will also be shown as a poster presentation at the national conference of the American Association of Nurse Practitioners (AANP). The poster will be produced by the DNP student to disseminate the outcome of the project. Furthermore, the DNP student will also write up the study results for publication consideration in several journals by the AANP, ADA, National Association of Academic Doctors, and AADE.

Analysis of Self

As a practitioner, my passion for the field of nursing started when I was young. This led me to pursue nursing as a profession, and I was determined to get to the doctoral level. As a current family NP and a project manager, I was faced with the challenges of how to be an effective leader in my community, and how I can utilize my skills to bring positive change to the nursing profession while delivering quality care that meets practice standards. My DNP project has granted me the opportunity to prove that I can be a successful and efficient leader, and that I can carry out the social mandate described by McCurry, Revell, and Roy (2010) who proposed that nurses should use their acquired skills to influence the knowledge of clinical and professional nurses.

As a scholar, this project has increased my knowledge and professional skills. I had the privilege to gain more information about DSMES guidelines as stipulated by the ADA and AADE. Through determination and perseverance to complete my DNP

program, there has been tremendous improvement in my ability to lead, and to contribute to the field of nursing. My DNP project has solidified my strength and ability to use evidence-based research to deliver safe and quality care to patients, families and the community as a whole. This project has also taught me the skills necessary to integrate different measures to resolve a complicated phenomenon.

As a project manager, I figured out the best and effective method of disseminating the project among the staff members without disrupting their daily routines at work. Scheduling the meeting times was easier than I thought because of the staff's enthusiasm for the project. The staff members even unanimously suggested the location and time for the training. My long-term professional goal is to continue to develop measures that will improve patients' awareness and involvement in their care.

This project will close the gap between recommended EBP and actual practice of the staff at the clinic, and may be used as a teaching tool in similar settings. Evidence has proven that diabetic self-management education is the cornerstone for improving patient's adherence to treatment regimen, and improving patients' health outcome (Beck et al., 2017; Powers et al., 2015). A good example is this educational module that included PowerPoint presentation, scholarly prepared modules and handouts on DSMES. The handouts served as a take home educational tool that can be given to a broader audience for reference and teaching purposes among nursing professionals, student nurses, staff nurses of similar setting. Given all these elements, the staff education module has the potential to increase engagement of diabetes patients in self-care with the goal of improving the quality of care, promoting health, and preventing complications.

Summary

In conclusion, the purpose of the project, the goals and overall outcome of the project were successfully met. I developed the training module based on clinical practice guidelines and protocols of DSMES during this project to improve the knowledge of staff in order to enable delivery of quality care while preventing complications of T2DM.

Health care professionals must be equipped with knowledge of current recommended EBPs in order to effectively promote health, prevent complications and deliver quality care to patients diagnosed with diabetes (Powers et al., 2015). Increasing knowledge among nursing staff could translate into awareness of the importance of quality care delivery among patients and the assurance of their safety (Tang, Funnell, & Oh, 2012).

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Appendix A: DSME Presentation

Page 1

DSME and DSMS algorithm of care.

Diabetes Self-management Education and Support for Adults With Type 2 Diabetes: Algorithm of Care

ADA *Standards of Medical Care in Diabetes* recommends all patients be assessed and referred for:

Nutrition — Registered dietitian for medical nutrition therapy ⟺ **Education** — Diabetes self-management education and support ⟺ **Emotional Health** — Mental health professional, if needed

Four critical times to assess, provide, and adjust diabetes self-management education and support

1	2	3	4
At diagnosis	***Annual*** assessment of education, nutrition, and emotional needs	When new ***complicating factors*** influence self-management	When ***transitions*** in care occur
When primary care provider or specialist should consider referral:			
❑ Newly diagnosed. All newly diagnosed individuals with type 2 diabetes should receive DSME/S ❑ Ensure that both nutrition and emotional health are appropriately addressed in education or make separate referrals	❑ Needs review of knowledge, skills, and behaviors ❑ Long-standing diabetes with limited prior education ❑ Change in medication, activity, or nutritional intake ❑ HbA_{1c} out of target ❑ Maintain positive health outcomes ❑ Unexplained hypoglycemia or hyperglycemia ❑ Planning pregnancy or pregnant ❑ For support to attain and sustain behavior change(s) ❑ Weight or other nutrition concerns ❑ New life situations and competing demands	Change in: ❑ Health conditions such as renal disease and stroke, need for steroid or complicated medication regimen ❑ Physical limitations such as visual impairment, dexterity issues, movement restrictions ❑ Emotional factors such as anxiety and clinical depression ❑ Basic living needs such as access to food, financial limitations	Change in: ❑ Living situation such as inpatient or outpatient rehabilitation or now living alone ❑ Medical care team ❑ Insurance coverage that results in treatment change ❑ Age-related changes affecting cognition, self-care, etc.

Margaret A. Powers et al. Dia Care 2015;38:1372-1382

American Diabetes Association.

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Content for DSME and DSMS at four critical time points.

Diabetes Self-management Education and Support Algorithm: Action Steps

Four critical times to assess, provide, and adjust diabetes self-management education and support

At diagnosis	***Annual*** assessment of education, nutrition, and emotional needs	When new ***complicating factors*** influence self-management	When ***transitions*** in care occur
Primary care provider/endocrinologist/clinical care team: areas of focus and action steps			
❑ Answer questions and provide emotional support regarding diagnosis ❑ Provide overview of treatment and treatment goals ❑ Teach survival skills to address immediate requirements (safe use of medication, hypoglycemia treatment if needed, introduction of eating guidelines) ❑ Identify and discuss resources for education and ongoing support ❑ Make referral for DSME/S and MNT	❑ Assess all areas of self-management ❑ Review problem-solving skills ❑ Identify strengths and challenges of living with diabetes	❑ Identify presence of factors that affect diabetes self-management and attain treatment and behavioral goals ❑ Discuss effect of complications and successes with treatment and self-management	❑ Develop diabetes transition plan ❑ Communicate transition plan to new health care team members ❑ Establish DSME/S regular follow-up care
Diabetes education: areas of focus and action steps			
Assess cultural influences, health beliefs, current knowledge, physical limitations, family support, financial status, medical history, literacy, numeracy to determine content to provide and how: ❑ Medications—choices, action, titration, side effects ❑ Monitoring blood glucose—when to test, interpreting and using glucose pattern management for feedback ❑ Physical activity—safety, short-term vs. long-term goals/recommendations ❑ Preventing, detecting, and treating acute and chronic complications ❑ Nutrition—food plan, planning meals, purchasing food, preparing meals, portioning food ❑ Risk reduction—smoking cessation, foot care ❑ Developing personal strategies to address psychosocial issues and concerns ❑ Developing personal strategies to promote health and behavior change	❑ Review and reinforce treatment goals and self-management needs ❑ Emphasize preventing complications and promoting quality of life ❑ Discuss how to adapt diabetes treatment and self-management to new life situations and competing demands ❑ Support efforts to sustain initial behavior changes and cope with the ongoing burden of diabetes	❑ Provide support for the provision of self-care skills in an effort to delay progression of the disease and prevent new complications ❑ Provide/refer for emotional support for diabetes-related distress and depression ❑ Develop and support personal strategies for behavior change and healthy coping ❑ Develop personal strategies to accommodate sensory or physical limitation(s), adapting to new self-management demands, and promote health and behavior change	❑ Identify needed adaptions in diabetes self-management ❑ Provide support for independent self-management skills and self-efficacy ❑ Identify level of significant other involvement and facilitate education and support ❑ Assist with facing challenges affecting usual level of activity, ability to function, health beliefs, and feelings of well-being ❑ Maximize quality of life and emotional support for the patient (and family members) ❑ Provide education for others now involved in care ❑ Establish communication and follow-up plans with the provider, family, and others

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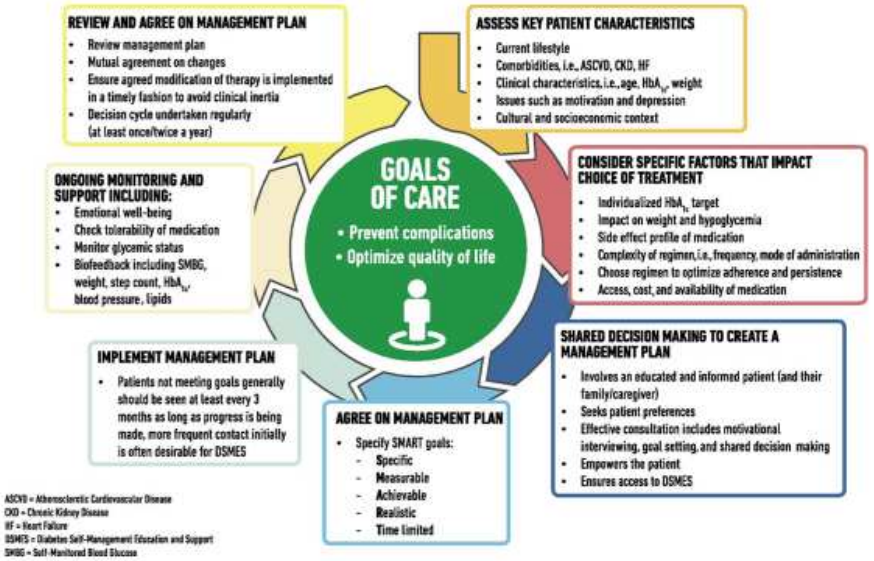
Decision cycle for patient-centered glycemic management in type 2 diabetes.



ASCVD = Atherosclerotic Cardiovascular Disease
CKD = Chronic Kidney Disease
HF = Heart Failure
DSMES = Diabetes Self-Management Education and Support
SMBG = Self-Monitored Blood Glucose

American Diabetes Association Dia Care 2019;42:S34-S45

American Diabetes Association.

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Table 4.1 – Components of the comprehensive diabetes medical evaluation at initial, follow-up, and annual visits

		Initial visit	Every follow-up visit	Annual visit
Past medical and family history	**Diabetes history**			
	• Characteristics at onset (e.g., age, symptoms)	✓		
	• Review of previous treatment regimens and response	✓		
	• Assess frequency/cause/severity of past hospitalizations	✓		
	Family history			
	• Family history of diabetes in a first-degree relative	✓		
	• Family history of autoimmune disorder	✓		
	Personal history of complications and common comorbidities			
	• Macrovascular and microvascular	✓		✓
	• Common comorbidities (e.g., obesity, OSA)	✓		
	• Hypoglycemia: awareness/frequency/causes/timing of episodes	✓	✓	✓
	• Presence of hemoglobinopathies or anemias	✓		
	• High blood pressure or abnormal lipids	✓		✓
	• Last dental visit	✓		✓
	• Last dilated eye exam	✓		✓
	• Visits to specialists	✓	✓	✓
	Interval history			
	• Changes in medical/family history since last visit		✓	✓
Lifestyle factors	• Eating patterns and weight history	✓	✓	✓
	• Physical activity and sleep behaviors	✓	✓	✓
	• Tobacco, alcohol, and substance use	✓		✓
Medications and vaccinations	• Current medication regimen	✓	✓	✓
	• Medication-taking behavior	✓	✓	✓
	• Medication intolerance or side effects	✓	✓	✓
	• Complementary and alternative medicine use	✓	✓	✓
	• Vaccination history and needs	✓		✓
Technology use	• Assess use of health apps, online education, patient portals, etc.	✓		✓
	• Glucose monitoring (review/CGM): results and data use	✓	✓	✓
	• Review insulin pump settings and use	✓	✓	✓
Behavioral and diabetes self-management skills	**Psychosocial conditions**			
	• Screen for depression, anxiety, and disordered eating; refer for further assessment or intervention if warranted	✓		✓
	• Identify existing social supports	✓		
	• Consider assessment for cognitive impairment*	✓		✓
	Diabetes self-management education and support			
	• History of dietitian/diabetes educator visits/classes	✓	✓	✓
	• Assess diabetes self-management skills and barriers	✓		✓
	• Assess familiarity with carbohydrate counting (Type 1 diabetes)	✓		
	Pregnancy planning			
	• For women with childbearing capacity, review contraceptive needs and preconception planning	✓	✓	✓

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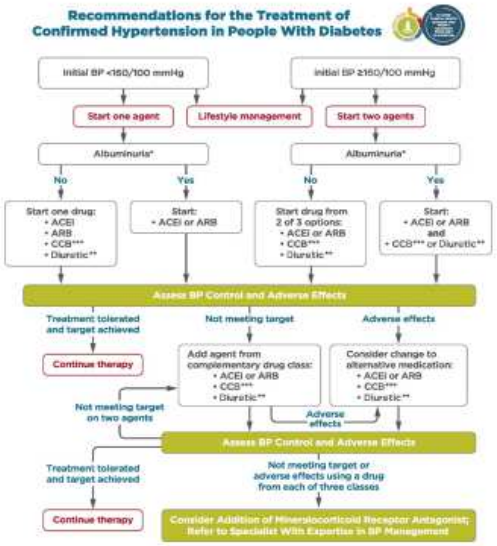
American Diabetes Association.

Recommendations for the treatment of confirmed hypertension in people with diabetes. *An ACE inhibitor (ACEi) or angiotensin receptor blocker (ARB) is suggested to treat hypertension for patients with urine albumin-to-creatinine ratio 30–299 mg/g creatinine and strongly recommended for patients with urine albumin-to-creatinine ratio ≥300 mg/g creatinine. **Thiazide-like diuretic; long-acting agents shown to reduce cardiovascular events, such as chlorthalidone and indapamide, are preferred. ***Dihydropyridine calcium channel blocker (CCB).



American Diabetes Association Dia Care 2019;42:S103-S123

American Diabetes Association.

Table 4.1 (cont.)– Components of the comprehensive diabetes medical evaluation at initial, follow-up, and annual visits

		INITIAL VISIT	EVERY FOLLOW-UP VISIT	ANNUAL VISIT
PHYSICAL EXAMINATION	• Height, weight, and BMI; growth/pubertal development in children and adolescents	✓	✓	✓
	• Blood pressure determination	✓	✓	✓
	• Orthostatic blood pressure measures (when indicated)	✓		
	• Fundoscopic examination (refer to eye specialist)	✓		✓
	• Thyroid palpation	✓		✓
	• Skin examination (e.g., acanthosis nigricans, insulin injection or insertion sites, lipodystrophy)	✓	✓	✓
	• Comprehensive foot examination			
	• Visual inspection (e.g., skin integrity, callous formation, foot deformity or ulcer, toenails)**	✓		✓
	• Screen for PAD (pedal pulses–refer for ABI if diminished)	✓		✓
	• Determination of temperature, vibration or pinprick sensation, and 10-g monofilament exam	✓		✓
LABORATORY EVALUATION	• A1C, if the results are not available within the past 3 months	✓	✓	✓
	• If not performed/available within the past year	✓		✓
	• Lipid profile, including total, LDL, and HDL cholesterol and triglycerides[a]	✓		✓[b]
	• Liver function tests[a]	✓		✓
	• Spot urinary albumin-to-creatinine ratio	✓		✓
	• Serum creatinine and estimated glomerular filtration rate[c]	✓		✓
	• Thyroid-stimulating hormone in patients with type 1 diabetes[d]	✓		✓
	• Vitamin B12 if on metformin (when indicated)	✓		✓
	• Serum potassium levels in patients on ACE inhibitors, ARBs, or diuretics[e]	✓		✓

ABI, ankle-brachial pressure index; ARBs, angiotensin receptor blockers; CGM, continuous glucose monitors; OSA, obstructive sleep apnea; PAD, peripheral arterial disease

[a]At 65 years of age or older

[e]may be needed more frequently in patients with known chronic kidney disease or with changes in medications that affect kidney function and serum potassium (see Table 11.2)

[d]may also need to be checked after initiation or dose changes of medications that affect these laboratory values (i.e., diabetes medications, blood pressure medications, cholesterol medications, or thyroid medications)

[b]In people without dyslipidemia and not on cholesterol lowering therapy, testing may be less frequent.

[c]Should be performed at every visit in patients with sensory loss, previous foot ulcers, or amputations

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American Diabetes Association.

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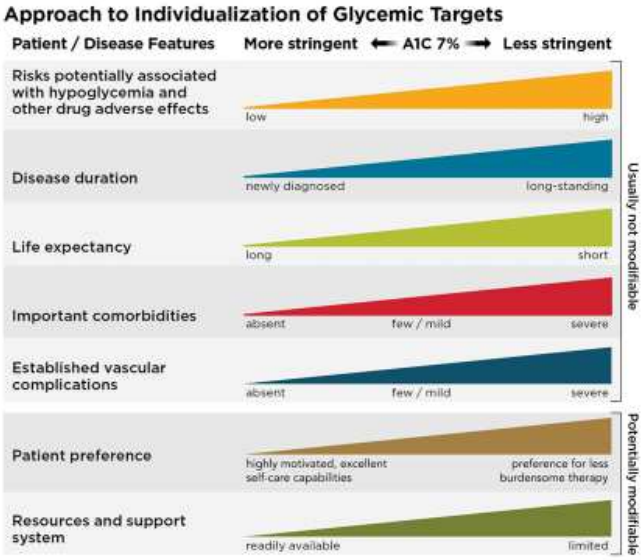
Depicted are patient and disease factors used to determine optimal A1C targets.



American Diabetes Association Dia Care 2019;42:S61-S70

American Diabetes Association.

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ADA risk test (diabetes.org/socrisktest).

American Diabetes Association Dia Care 2019;42:S13-S28

American Diabetes Association.

Appendix B: Handout on Diabetes Self-Management Education and Support (DSMES)

ADA Standards of Medical Care in Diabetes recommends all patients be assessed and referred for: Nutrition, Education, and Emotional Health.

There are four critical times to assess, provide, and adjust DSMES:

At diagnosis

- Newly diagnosed individuals with type 2 diabetes should receive DSMES
- Ensure that both nutrition and emotional health are appropriately addressed in education in education or make separate referrals

Annual assessment of education, nutrition, and emotional needs

- Needs review of knowledge, skills, and behaviors
- Long-standing diabetes with limited prior education
- Change in medication, activity, or nutritional intake
- HbA1c out of target
- Maintain positive health outcomes
- Unexplained hypoglycemia or hyperglycemia
- Planning pregnancy or pregnant
- For support to attain and sustain behavior change(s)
- Weight or other nutrition concerns
- New life situations and competing demands

When new ***complicating factors*** influence self-management
Change in:

- Health conditions such as renal disease and stroke, need for steroid or complicated medication regimen
- Physical limitations such as visual impairment, dexterity issues, movement restrictions
- Emotional factors such as anxiety and clinical depression
- Basic living needs such as access to food, financial limitations

When ***transitions*** in care occur
Change in:

- Living situation such as inpatient or outpatient rehabilitation or now living alone
- Medical care team
- Insurance coverage that results in treatment change
- Age-related changes affecting cognition, self-care, etc.

DSMES Algorithm: Action Steps

Primary care provider/endocrinologist/clinical care team: areas of focus and action steps

At diagnosis

- Answer questions and provide emotional support regarding diagnosis
- Provide overview of treatment and treatment goals
- Teach survival skills to address immediate requirements (safe use of medication, hypoglycemia treatment if needed, introduction of eating guidelines)
- Identify and discuss resources for education and ongoing support
- Make referral for DSME/S and MNT

Annually

- Assess all areas of self-management
- Review problem-solving skills
- Identify strengths and challenges of living with diabetes

When new ***complicating factors*** influence self-management

- Identify presence of factors that affect diabetes self-management and attain treatment and behavioral goals
- Discuss effect of complications and successes with treatment and self-management

When ***transitions*** in care occur

- Develop diabetes transition plan
- Communicate transition plan to new health care team members
- Establish DSME/S regular follow-up care.

Diabetes education: areas of focus and action steps

At diagnosis

Assess cultural influences, health beliefs, current knowledge, physical limitations, family support, financial status, medical history, literacy, numeracy to determine content

- Medications – choices, action, titration, side effects
- Monitoring blood glucose-when to test, interpreting & using glucose pattern management for feedback
- Physical activity –safety, short-term vs long-term goals/ recommendations
- Preventing, detecting, and treating acute and chronic complications
- Nutrition – food plan planning meals, purchasing food, preparing meals, portioning food
- Risk reduction – smoking cessation, foot care
- Developing personal strategies to address psychosocial issues & concerns
- Developing personal strategies to promote health & behavior change

Annual assessment of education, nutrition, and emotional needs

- Review and reinforce treatment goals and self-management needs
- Emphasize preventing complications and promoting quality of life
- Discuss how to adapt diabetes treatment & self-management to new life situations & competing demands
- Support efforts to sustain initial behavior changes & cope with ongoing diabetes

When new ***complicating factors*** influence self-management

- Provide support for provision of self-care skills to delay disease progression & prevent new complications
- Provide/refer for emotional support for diabetes-related distress & depression
- Develop & support personal strategies for behavior change and healthy coping
- Develop personal strategies to accommodate sensory or physical limitation(s),

When ***transitions*** in care occur

- Identify needed adaptions in diabetes self-management
- Provide support for independent self-management skills and self-efficacy
- Identify level of significant other involvement and facilitate education and support
- Assist with facing challenges affecting usual level of activity, ability to function, health beliefs, and feelings of well-being
- Maximize quality of life and emotional support for the patient (and family members)
- Provide education for others now involved in care
- Establish communication and follow-up plans with the provider, family, and others.

Reference: Powers et al. (2015). *Diabetes Care, 38*(7), 1372-1382.

Appendix C: Pretest Questionnaire

Please read each of the following statements and circle the appropriate option that corresponds to your current level of knowledge and attitudes about diabetes among patients at the clinic.

Please make note of the number at the top of your survey and make certain that you indicate the same one on the post-test survey for identification purposes.

Yes / No	1.	Did you check T2DM patients' knowledge of diabetes, and how to manage it?
Yes / No	2.	Did you teach T2DM patients exercise requirements, and types of exercises?
Yes / No	3.	Did you teach T2DM patients how to access resources to help them self-manage their diabetes?
Yes / No	4.	Did you teach T2DM patients how to set goals for managing their diabetes?
Yes / No	5.	Did you teach T2DM patients weight management strategies if indicated?
Yes / No	6.	Did you teach T2DM patients how to monitor their blood glucose?
Yes / No	7.	Did you teach T2DM patients the difference between daily blood glucose value and A1c Glycohemoglobin test value?
Yes / No	8.	Did you teach the importance of getting an annual eye exam?
Yes / No	9.	Did you teach the importance of routine foot care?
Yes / No	10.	Did you discuss how to self-manage their medications?
Yes / No	11.	Did you discuss stress management?
Yes / No	12.	Did you teach T2DM patients how to plan their meals?
Yes / No	13.	Did you teach diabetes related complications and how it can be avoided?

Appendix D: Posttest Questionnaire

Please read each of the following statements and circle the appropriate option that corresponds to your current level of knowledge and attitudes about diabetes among patients at the clinic.

Please make note of the number at the top of your survey and make certain that it is the same one on pre-test survey, for identification purposes.

Yes / No	1.	Will you check T2DM patients' knowledge of diabetes, and how to manage it?
Yes / No	2.	Will you teach T2DM patients exercise requirements, and types of exercises?
Yes / No	3.	Will you teach T2DM patients how to access resources to help them self-manage their diabetes?
Yes / No	4.	Will you teach T2DM patients how to set goals for managing their diabetes?
Yes / No	5.	Will you teach T2DM patients weight management strategies if indicated?
Yes / No	6.	Will you teach T2DM patients how to monitor their blood glucose?
Yes / No	7.	Will you teach T2DM patients the difference between daily blood glucose value and A1c Glycohemoglobin test value?
Yes / No	8.	Will you teach the importance of getting an annual eye exam?
Yes / No	9.	Will you teach the importance of routine foot care?
Yes / No	10.	Will you discuss how to self-manage their medications?
Yes / No	11.	Will you discuss stress management?
Yes / No	12.	Will you teach T2DM patients how to plan their meals?
Yes / No	13.	Will you teach diabetes related complications and how it can be avoided?